Chemical Weapons

Modern chemical weapons (CW) were first used on a large scale in 1915 and became a prominent feature in the battles of World War I. Chemical weapons were the product of scientific advances, technological developments and industrialisation. The efforts to prohibit their use in war began as early as 1899 but accelerated after the Armistice of 1918. Today, the 1993 Chemical Weapons Convention (CWC) is the strongest ban on CW development, production, stockpiling and use in force. However, since the mid-1990s, new ways of using toxic agents have emerged, including in terrorism, crime and assassination operations. From 2013 on, chemical warfare also returned to the forefront in the Syrian civil war, with CW use attributed to government military forces and the Islamic State in Iraq and the Levant (ISIL). Although all CW declared under the CWC have now been destroyed, the problem of CW has not completely disappeared. New scientific and technological developments challenge the prohibition because they may allow new types of toxic agents, production methods or dissemination methods, in which new categories of actors may acquire an interest. This learning unit introduces you to the history of CW use, the different types of agents, and the efforts to outlaw their manufacture, possession and use under any circumstances. It also discusses the various challenges to the norm against CW and the efforts to strengthen that norm in view of evolving threats and challenges.

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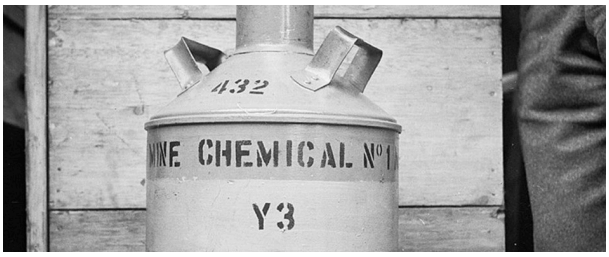
1. Introduction

Chemical weapon basics



British Chemical Mine No. 1 Mk 1, 1940, Malindine E G (Lt).
https://commons.wikimedia.org/wiki/File:Chemical_mine.jpg#/media/File:Chemical_mine.jpg
(Public domain)

Operation Ranch Hand: Spraying Agent Orange to deny the enemy jungle cover during the Viêt-Nam war in the 1960s.
National Museum of the U.S. Air Force (Public domain)

Chemical warfare is the intentional application for hostile purposes of toxic substances against humans and their environment. Toxic substances – poisons – interfere with life processes, thereby causing temporary or permanent damage to a living organism or killing it altogether. In warfare, humans are the primary target of armed action. However, besides anti-personnel chemical weapons, toxic warfare agents can also be directed against animals and plants.

Even though modern chemical warfare began in World War I (1914–1918) and the last of the chemical weapons declared under the 1993 Chemical Weapons Convention were destroyed under the supervision of the Organisation for the Prohibition of Chemical Weapons in July 2023, the challenge of controlling the use of toxic chemical substances continues to this day.

This learning unit section introduces you to the nature of chemical weapons and the consequences of exposure to them.

What are chemical weapons?
- definition of CW
- military utility of CW
- relationship between offence and defence
- major CW classes

Chemical weapons are any poisonous substances that are used deliberately to harm humans, animals or plants.

While other weapons may also have poisonous effects, toxicity is a secondary effect and not exploited for military purposes. In this sense, chemical weapons stand apart from

- smoke, which is used to obscure positions or mark targets;
- incendiary weapons, which are used to produce flame, mark targets or obscure view, or
- radiological weapons whose source of poisoning is radiation rather than a chemical reaction.

According to the definition set out in the Chemical Weapons Convention, a chemical weapon comprises three components. Besides the toxic agent, it also covers the means of delivery, such as a bomb or spray tank, and specialised equipment – e.g. to fill munitions with a chemical warfare agent. The convention treats any combination of these three components, as well as each component separately, as a chemical weapon.

The toxic agent The toxic agent is the poisonous substance that may cause harm to living organisms. There is a wide range of toxic chemicals, both naturally occurring and synthesised in the laboratory.

Agents used for warfare purposes may be

- gases (e.g. chlorine);
- liquids (e.g. sarin or mustard agent); or
- solids (e.g. CS lachrymator).

However, not all toxic chemicals are suited for warfare. Warfare agents represent a compromise between different factors, including ease of production, long-term storage, stability after release and desired impact on the target.

There are literally millions of highly toxic chemicals. Some potent ones even occur in nature and are mineral, animal or plant in origin. Some of the most poisonous substances known to humankind are toxins. Chemistry has added to the list of toxic substances, and the chemical industry is able to produce some of them in very large quantities. Today, chlorine, the agent used in the first major chemical attack in 1915, is produced in excess of 60 million tonnes a year. Moreover, research into new molecules results in the official registration of more than 170 million compounds each year. A considerable number of these will undoubtedly be highly poisonous, including substances that exceed the toxicity of the deadliest nerve agents by multiple orders of magnitude. Applying artificial intelligence (AI) to molecule design is likely to increase the number of new toxic compounds even further.

It may therefore appear remarkable that over the past 100 years, relatively few toxic chemicals were incorporated into the military arsenals and militaries around the world essentially selected similar types of agents. Variations in most cases were due to different methods of synthesis, manufacturing processes or the use of alternative precursor chemicals.

All major belligerents in World War I scanned many tens of thousands of potentially toxic compounds in the search for new and more effective chemical warfare agents. [1] However, since then only around 70 different chemicals were eventually used or stockpiled as warfare agents. An even lower number were standardised because a militarily useful agent actually represents a compromise between different demands:[2]

The delivery system Chemical warfare agents can be applied in several ways, including pouring the poisonous substance into a water container or delivery on the battlefield during an artillery barrage. However sophisticated or primitive the CW programme, a means to deliver an agent on the target will always be required.

The possibilities include:

- missile warheads and bombs;
- shells and grenades;
- aerosol generators and spray tanks.

But the technology may also be simple, including:

- precursor chemicals to a warfare agent rubbed on the victim (assassination of Kim Jong-nam, 2017);
- plastic bags (Aum Shinrikyo on the Tokyo underground, 1995);
- barrel bombs (Syrian civil war, 2013–2018);
- lorries filled with a toxic agent in suicide attacks (al-Qaeda in Iraq, 2006 and 2007, and ISIL in Syria, 2014–2015).

Specific equipment required to enable chemical warfare While the toxic agent and the delivery system are the CW components that readily come to mind, different types of specifically designed equipment are needed in connection with the use of the munitions and devices mentioned above.

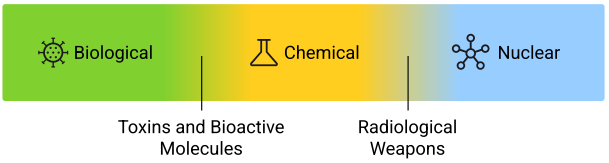
These may include:

- various types of installations to fill munitions with agent;
- tools to calibrate certain types of equipment;
- equipment for testing the agent quality.

Chemical weapons and other non-conventional weapons

A definition of chemical weapons suggests a clear and distinct arms category. In the case of the Chemical Weapons Convention, such sharp delineation is necessary to effectively implement the treaty provisions, especially those related to the verification regime. (The Chemical Weapons Convention will be discussed later in this learning unit.)

In reality, there are three main and distinct categories of non-conventional weapons but the boundaries between them are fuzzy.



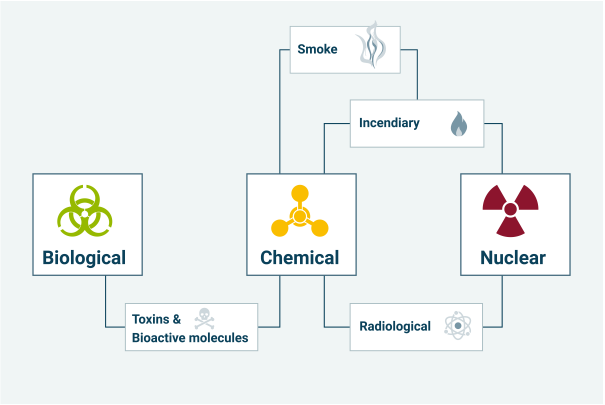
Three main categories of non-conventional weapons with fuzzy boundaries

Grübelfabrik

The three distinct categories are as follows:

- Chemical weapons comprise toxic organic or inorganic molecules not usually found in nature. The toxic agents are the product of scientific research and industrial production (especially for warfare purposes) or laboratory synthesis (if smaller quantities are required).
- Biological weapons include self-replicating microbial organisms able to cause disease in humans, animals or plants. They occur naturally, but recent technological advances allow their genetic modification or synthetic design and production.
- Blast and heat are the principal destructive forces of nuclear weapons. However, they result from the energy released by fission or fusion reactions. Radiation is the third and least desired product of the nuclear reaction.

In between these three main categories, there are other types of weaponry combining characteristics, actions or effects of more than one main non-conventional weapon category:



The three main types of non-conventional weaponry and crossover weapon categories

Grübelfabrik

Between biological and chemical weapons:

- *Toxins* are poisons produced by living organisms, including animals, plants and bacteria. Several of these are among the most toxic substances known to humans. Given their biological origin and poisonous action on humans, animals or plants, toxins are covered by both the Biological and Toxin Weapons Convention and the Chemical Weapons Convention.
- *Bioactive molecules* are subcellular particles that help regulate an organism's life processes. They include proteins, peptides and prions. Research into bioactive molecules plays a key role in the development of novel central nervous system (CNS)-acting agents (previously referred to as 'incapacitating agents').
- Advances in nanobiotechnology and nanobioscience, too, hold the potential for future synthetically developed agents that blur the distinction between biological and chemical agents.

Between chemical and nuclear weapons:

- *Radiation poisons* living organisms. Radiological weapons or other dispersal devices specifically seek to exploit this characteristic. However, the poisoning is not the result of the agent's direct toxic action, as is the case with CW.
- *Incendiary agents* produce extreme heat and are able to set many materials alight, including metals and steel. The heat is the consequence of a chemical reaction, but its effect on living organisms is not a consequence of the agent's direct toxic action, as is the case with CW.

Between chemical and incendiary weapons:

- In the past, favourable winds steered smoke from toxic candles to enemy lines or poisonous smoke could force defenders to abandon enclosed positions. Some incendiary weapons, such as white phosphorus, are used to generate smokescreens. In high concentrations (e.g. in enclosed positions), the smoke may prove sufficiently toxic to harm humans or animals. Exploiting toxicity is not the customary purpose for using incendiary weapons.

Contrary to chemical and biological weapons, the use of nuclear or radiological weapons is not explicitly prohibited. Incendiary weapon use is regulated under international humanitarian law, notably Protocol III of the Convention on Certain Conventional Weapons [`https://geneva-s3.unoda.org/static-unoda-site/pages/templates/the-convention-on-certain-conventional-weapons/PROTOCOL%2BIII.pdf`].

Classification of chemical warfare agents

There are many different ways of classifying chemical warfare agents. The most common method is based on the physiological consequences of exposure. Here, we can distinguish between six major CW categories: choking agents, blood agents, blister agents, nerve agents, central nervous system-acting agents, harassing agents and anti-plant agents. (Some agents may produce symptoms characteristic of more than one category.)

Choking agents injure the respiratory tract, flood the lungs with fluids and consequently impede breathing.

- *Examples:* chlorine, chloropicrin, phosgene **Blood agents** prevent the exchange of oxygen between the lungs and the red blood cells, and hence the transportation of oxygen to the different parts of the body.
- *Examples:* hydrogen cyanide, cyanogen chloride, phosgene The various mustard agents are **blister agents** or **vesicants**. Besides affecting the respiratory tract if inhaled, blister agents attack the skin. Some other agents may also cause blistering or severe rashes and may, therefore, be listed as blister agents.
- *Examples:* nitrogen mustard, sulphur mustard, lewisite
- *Occasionally listed as a blister agent:* phosgene oxime

Trigger warning, variant 1, flipcards

- **Trigger warning**

Iranian mustard agent casualty, Iran–Iraq War, 1984
Iranian Embassy/Jean-Pascal Zanders

Trigger warning, variant 2, tabs, first tab text only

Warning!
Trigger warning!

Picture

Iranian mustard agent casualty, Iran–Iraq War, 1984
Iranian Embassy/Jean-Pascal Zanders

Trigger warning, variant 3, callout

Trigger warning! The following photo shows a person seriously injured by mustard gas. This picture can be very disturbing. Click on 'Expand' if you still want to see it.

Iranian mustard agent casualty, Iran–Iraq War, 1984
Iranian Embassy/Jean-Pascal Zanders

Nerve agents were first discovered in the late 1930s while researching new insecticides. They attack the central nervous system. They can kill rapidly as their toxic action on the central nervous system interferes with the functioning of organs and the coordination between those organs.

- Examples: tabun, sarin, soman, VX, and novichok agents **Trigger warning, variant 3, tabs, first tab pixelated image**

Warning!
Trigger warning! The photo on the next tab shows the unpixelated image of this dead young victim to nerve agents.

Instantaneous death, Halabja (March 1988)
Iranian Embassy/Jean-Pascal Zanders

Picture

Instantaneous death, Halabja (March 1988)
Iranian Embassy/Jean-Pascal Zanders

Whereas the toxic chemicals in the four categories above are also known as lethal agents, those in the following categories are often viewed as non-lethal (although they too can kill if the dose is high enough or a person is exposed for a long time).

Harassing agents produce strong sensory irritation, but their effects disappear soon after an exposed person is evacuated from the affected area.

- *Examples:*
- ◦ Lacrymatory (riot control) agents: chloropicrin, CN, CS, oleoresin capsicum (pepper spray)
- ◦ Malodorant agents: skunk, stink bombs
- ◦ Sternutator (sneezing) agents: diphenylchloroarsine (DA, Clark I), diphenylcyanarsine (DC, Clark II), phenyldichloroarsine (Pfiffikus, phenyl Dick)
- ◦ Vomiting agents: adamsite (DM), chloropicrin

Central nervous system (CNS)-acting agents also have temporary effects on victims, but these last considerably longer – sometimes for hours or days – after exposure. They interfere with the functions of the central nervous system, causing a person to become uncoordinated and consequently incapable of coherent actions.

- *Examples:* BZ, fentanyl, LSD **Anti-plant agents** also come in different forms, such as defoliants, growth inhibitors or herbicides. Their primary purpose is to damage the enemy's ability to grow food. They have also been used to defoliate forests in tropical regions, such as in the Vietnam War in the 1960s, so that enemy troop movements can no longer benefit from the cover offered by the trees.
- *Examples:* Agent Orange, Agent White

Spraying of Agent Orange over Indochina during Operation Ranch Hand

1. SIPRI. 1971. The Problem of Chemical and Biological Warfare, Volume I: The Rise of CB Weapons. Almqvist & Wiksell, 38.
2. Ibidem, and Försvarets Forskningsanstalt (Defence Research Establishment, FOA). Chemical Weapons: Threat, Effects and Protection, FOA Briefing Book no. 16. FOA, 20.

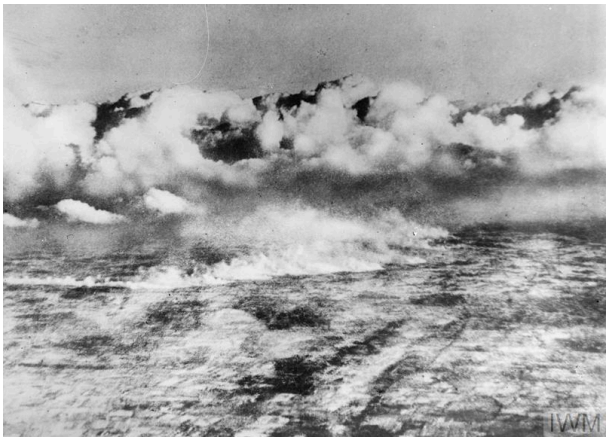
2. The History of Chemical Warfare

Major CW Incidents Before 1945

German battery of chlorine gas cylinders being prepared for an attack, awaiting the right weather conditions to prevent blowback; similar to the arrangement at Hill 60 in May 1915

(Public domain)

World War 1



Gas Attack by the German Army on the Osowiec Fortress, Poland, during the 1st World War

Imperial War Museum IWMQ 12286 (Public domain)

Modern chemical warfare (G) began on 22 April 1915 with the release by German Imperial troops of a massive chlorine cloud near Ypres, Belgium. The war became an accelerating competition between increasingly lethal agents and improvements in chemical defence. By late 1918 50% of all shells fired were chemical.

Spanish Morocco

Between 1921 and 1927 Spain and France deployed various chemical warfare agents against the Berber rebels during the Rif war. It was the first use of CW in a colonial war.

Italo-Abyssinian War

Italy resorted to CW (G) in its colonial campaign against Ethiopian troops between October 1935 and May 1936.

China

During the 2nd Sino-Japanese war (1937–45) Japan experimented with toxic chemical agents and used them extensively during the battle of Changde (November – December 1943)

Threat perceptions during the Interbellum

With the armistice chemical warfare ended.

Expectations were that if the war had continued into 1919 CW use would have surpassed that of conventional munitions. One new type of agent, Lewisite, was on board of transport ships en route from the USA to Europe when the arms fell silent.

The fear of CW did not disappear, however. World War 1 had been a war of innovation and aeroplanes in particular became part of future threat visions. Bombers armed with CW could annihilate whole cities, so it was feared. Politicians, peace campaigners, humanitarian organisations, etc., painted apocalyptic pictures of the end of humanity not unlike current views of nuclear warfare.

In Europe, a balance of terror combined with national civil defence preparations were among several factors that contributed to the prevention of gas warfare in World War 2.

Major CW Incidents After 1945

Viêt-Nam war

During the 1960s the USA progressively intensified the spraying of herbicides and defoliants over Viêt-Nam and neighbouring countries to deny North Viêt-Namese forces and insurgents jungle cover. Chemicals such as Agent Orange permanently destroyed large parts of the vegetation and are still the cause of illness and birth defects among the local population and US veterans.

Yemen civil war

Between 1962–70 several allegations were made that Egypt resorted to CW (G) during its intervention against Royalist forces. Some 40 incidents were reported.

Iran–Iraq war (1980–88)
Iraq initiated the largest CW use since World War 1 in 1982, possibly earlier. From late 1983 on CW became a regular feature and in the final two years systematised their use against Kurdish insurgents and civilians. Iran is not believed to have resorted to CW.

Syrian civil war
In 2013, two years into the war, reports of CW increased, culminating in the sarin attack against Ghouta in August. Since joining the CWC (G), attacks have continued with chlorine by both government forces and ISIL.

Cold War and its aftermath
World War 2 ended without sustained chemical warfare campaigns. The atomic bomb became the symbol of both military prowess and existential fear. CW disappeared to the background, but retained relevance for intra-war deterrence. The discovery of the extremely lethal and fast acting nerve agents in the 1930s drove post-war preparations. Up to end of the Cold War the USA and USSR built up and modernised arsenals comprising many tens of thousands of tonnes of warfare agents.

With the exception of the Việt-Nam war, all major chemical warfare (G) occurred and is still occuring in the Middle East. It is a historical fact and psychological factor that has been mostly overlooked in the efforts to free the region from non-conventional weaponry.

In 1987 Iraq introduced CW as a means of genocide against the Kurds; a mode of warfare currently also being waged by Syria.

Terrorism with Chemical Weapons

How great a threat?
After the end of the Cold War concerns about catastrophic, mass-casualty terrorism rose fast. Aum Shinrikyo's release of sarin in the Tokyo underground in March 1995 seemed to confirm the worst fears. After the 9/11 attacks against the USA, the fear escalated even further.

Until today the projected scenarios have not materialised. Acquisition of warfare agents have proved more complex than the availability of technologies and skills may suggest, not in the least because of the need for functional specialisation and the weapon programme alters internal group dynamics. Today greater transfer controls and law enforcement awareness have raised additional barriers.

Most incidents with toxicants are criminal in nature, including revenge attacks by individuals using commercial or off-the-shelf chemicals.

Download Additional Text (PDF)

Aum Shinrikyo's high-tech apocalypticism
The Japanese cult developed an apocalyptic religious doctrine that required it to develop advanced weaponry to battle and survive the forces of evil. Its doctrine incorporated many science fiction elements, which was part of the group's attraction for disaffected science and technology students and professionals.

Aum set up several weapon programmes, one of which was the production of 80 tonnes of sarin to help provoke Armageddon. It developed sarin and set up a production unit, which failed. However, the leadership became extremely paranoid about discovery as the project progressed. It also came in increasing conflict with Japanese society and the internal pressure to use the sarin to demonstrate its power before achieving full capacity grew. In June 1984 it created a sarin vapour to kill three judges set to rule in a land dispute; in March 1995 it released sarin in metro trains in Tokyo with the aim of preventing police raids on cult compounds. A far cry from its original goals, but the CW programme led to the cult's demise.

ISIL's opportunistic use of industrial toxicants
In 2006–07 al-Qaeda in Iraq launched a series of truck bomb attacks with chlorine against local Iraqi and US forces. The chlorine killed no one. AQI used the chlorine intended for water purification. AQI became the Islamic State in Iraq and the Levant (ISIL). In Syria it began experimenting with chlorine-filled mortar grenades, which in 2015 became more of a method of warfare rather than terrorism. It then expanded the practice in its operations against Kurds in Iraq. The OPCW (G) also confirmed incidents of ISIL mustard agent use in Syria and Iraq.

Quiz

View quiz at `https://eunpdc-elearning.netlify.app/lu-02/`

3. Evolution of the Norm against Chemical Weapons

From the Hague Peace Conference to the Rome Statute

Early Attempts Against CW

The video lecture covers the following topics:

- reference to early cultural interdictions
- reference to the Hague Peace Conference of 1899
- 1925 Geneva Protocol (G), and explanation of its impact on future norm building

Early Constraints on Chemical Warfare

Early bans on poisoned weapons

The *Manu Smrti*, a foundation of Hindu law, contains the earliest recorded prohibition on poison (G) use. It is over 2,000 years old. History also shows that cultures in different parts of the world adopted similar codes. However, the unilateral codes did not bind the enemy.

Religions opposed indiscriminate warfare, which is the root of the interdiction on poisons. In Islam it evolved from the prohibitions on flooding and fire in the 10th century. Christianity began framing similar codes in the Middle Ages. However, they applied only to one's own religious community. The Diaspora prevented Judaism from developing similar rules.

With the rise of the sovereign state, formal codification of the rules of war began in multilateral conferences in the 2nd half of the 19th century. The industrial revolutions also generated the first interest in arms control, but constraining technology was an idea whose time had not yet come.

First Hague Peace Conference

Fearing the impact of the industrial revolution on armaments, Russia, an agrarian society, convened the 1899 Hague Peace Conference. The meeting failed to limit armaments, but with the *Convention (II)* and annexed *Regulations* it codified the laws and customs of war on land. The document included an overall ban on the use of poison and poisoned weapons.

In recognition of technological progress, the Conference also concluded *Declaration (IV, 2) Concerning Asphyxiating Gases* outlawing the use of projectiles designed to diffuse asphyxiating or deleterious gases. The focus of the regulation, however, was on 'use', not the weapon as such.

The 1907 Hague Conference updated the Convention with its Regulations, but maintained the Declaration on asphyxiating gases. Most independent states at the time signed up to the document.

In 1915 the first gas attack circumvented the prohibition because gas cylinders rather than projectiles were used.

The Geneva Protocol

The 1925 Geneva Protocol (G) prohibits chemical and biological methods of warfare (G). It is a direct descendant of the 1899 Hague Declaration (IV, 2) and the 1919 Versailles Treaty banning Germany from using CW.

Even though never violated for biological warfare, at several occasions it could not prevent CW use. However, each time nations came together to renew their commitment to the agreement. Thus it gradually became part of customary law and is now seen as universally binding and applicable to any type of armed conflict.

Today it offers the legal foundation for the UN Secretary-General's Mechanism to investigate allegations of use. Its language has also been incorporated into the 1998 Rome Statute (G) that established the International Criminal Court. Both instruments will be discussed further in the chapter.

The Chemical Weapons Convention

The video lecture covers the following topics:

- Chemical Weapons Convention (G) and the role of the OPCW (G)
- General Purpose Criterion (G)
- OPCW, structure and division of labour with States Parties (National Authorities)
- verification (G) and compliance machinery
- decision-making process, including review conferences (G)

The CWC (G) was opened for signature in 1993 and entered into force in 1997. It established the Organisation for the Prohibition of Chemical Weapons (OPCW), which is based in The Hague. All states parties are member of the OPCW and have equal rights and obligations. The OPCW (G) oversees treaty implementation, organises verification and ensures compliance. To these ends it is supported by the Technical Secretariat with its inspectorate.

One of its principal tasks has been verifying (G) the destruction of CW. Eight states declared 72,525 metric tonnes of agents and 8.67 million items, including munitions and containers. At the 24th Conference of the States Parties (25-29 November 2019), the Technical Secretariat of the OPCW reported that as of 31 December 2018, 96.72% of warfare agents and

precursor chemicals were destroyed under international supervision. Destruction operations are expected to have been completed by 2023 at the latest. The OPCW is now increasingly focussing on the prevention of the re-emergence of CW and new challenges, including scientific and technological innovation, chemical security, and outreach to professional communities.

Universalisation (G)

Opening for signature (1993)
OPCW

As of July 2021, the CWC comprises 193 states parties. With this it is the world's most successful weapon control treaty. Only four states still need to ratify or accede to it: Egypt, Israel, North Korea and South Sudan.

General Purpose Criterion
The CWC does not prohibit toxic substances as such, but outlaws purposes to which they may be applied. Known as the 'General Purpose Criterion' (GPC) (G), the principle is contained in Article II of the CWC. Many toxic chemicals have legitimate industrial applications. In this way the CWC not only addresses the dual-use problem, but also covers any future toxic chemical.

Reinforcing the Norm against CW

While the CWC (G) and the Geneva Protocol (G) form the backbone of the norm against CW today, the international community has devised other instruments to support it. As has been the case since the late 19th century, security challenges evolve faster than the codification process.

The new tools are often action-oriented: they are the responsibility of individual states and implementation objectives are set against concrete timelines. Other characteristics often include the informality of the arrangement, the formation of a coalition of like-minded states, and the absence of lengthy, formal negotiations to set those instruments up. Another trend is the rising prominence of humanitarian and human rights law with the attendant focus on criminalising individual behaviour under international law.

The tools presented on this page are four among many initiatives launched or reinforced since the end of the Cold War.

Australia Group
The AG is an informal grouping of 42 states and the EU that aims to counter the spread of technologies and materials used for chemical and biological weapons through coordinated export controls, information sharing and outreach. It reviews its technology control lists at its annual meetings.

It was originally created in 1985 after UN confirmation of Iraq's CW use the year before.

UNSG's Investigative Mechanism
The UN Secretary-General's investigative mechanism evolved from the investigations into Iraq's violations of the Geneva Protocol between 1984–88. Formalised by UN resolutions, it allows the UNSG to dispatch fact-finding missions after a UN member request.

Regarding CW, the UNSG now draws on OPCW expertise in case of alleged use by or in a non-CWC party. For BW cases, he maintains a roster of national experts.

UNSC Resolution 1540 (2004)
After 9/11 the Security Council voted several anti-terrorism resolutions, including 1540 (G) that aims to prevent terrorist acquisition of nuclear, biological and chemical weapons. All UN members must adopt and enforce, as well as report to the 1540 Committee on appropriate national legislation.

Regarding CW, the obligations parallel those of Article VII of the CWC, but they apply to all UN members.

The 1998 Rome Statute and the ICC
The Rome Statute (G) defines CW use as a war crime in both international and internal conflicts. The Hague-based International Criminal Court can pursue such violations if national courts are unwilling or unable to try criminals or after UNSC referral.

The Rome Statute utilises the language of the Geneva Protocol and does not refer to the CWC or BTWC (G), as some countries wished to avoid any references to nuclear weapons.

4. Current Challenges Posed by Chemical Weapons

CBRN response training in the field.
OPCW

The video lecture covers the following topics:

- terrorism
- from the loner to Aum Shinrikyo
- opportunistic use of industrial toxicants
- dual-use technologies
- CWC (G) response
- Australia Group (G)
- national implementation (internal transfers to non-state actors)
- developments in science, technology and industry (production processes and reporting under the CWC)
- incapacitants
- current status Syria / Iraq

Addressing the Challenges

This interview covers the following topics:

- global community response
- Syria and chemical warfare (G)
- chemical safety and security
- training and capacity building
- international cooperation and technology exchanges
- national responses
- focus on role of national legislation
- EU support

Addressing Allegations of CW Use

Since early 2013 there have been repeated allegations of CW in the Syrian civil war. Syria joined the CWC (G) in October 2013 in the aftermath of the Ghouta sarin strikes on 21 August. Investigation of CW allegations consequently has two distinct phases.

Before Syria's accession to the CWC, the UN Secretary-General activated his investigative mechanism in cooperation with the OPCW (G) and WHO. The UN team was in Damascus when Ghouta was struck. It proved the use of sarin. Subsequent investigations confirmed some earlier CW claims.

While the OPCW was overseeing the elimination of Syria's CW capacities, several accounts of chlorine attacks emerged in early 2014. Testimonials that helicopters were launching the barrels pointed to government responsibility. The OPCW set up a Fact-Finding Mission, whose investigative reports confirmed chlorine use with high certainty.

Multiple attacks with chlorine and the nerve agent sarin were reported between 2015 and 2018. The Syrian government bears responsibility for most incidents. However, during 2015 there were also sporadic reports of ISIL attacks involving chemical warfare agents against Kurdish fighters in the north of the country that intensified during the late spring and early summer. In August mustard agent use by ISIL was reported. Again FFM investigations confirmed CW use.

Based on the FFM reports, the OPCW firmly condemned chemical warfare. However, the body cannot attribute blame. The UNSC is directly involved in Syria's CW disarmament and reports of CW use, but cannot formally condemn the Syrian government given Russia's backing. As a way out, it created the OPCW-UN Joint Investigative Mission tasked with identifying those responsible for the CW attacks. The JIM, however, cannot hold individuals criminally responsible. What will happen with its findings is unclear from UNSC Resolution 2235 (2015) and other documents.

In November 2017 Russia opposed the renewal of the mandate of the JIM in the UN Security Council, thereby ending a peer review process of the OPCW's analyses and the possibility of attributing responsibility for violating the norm against chemical warfare. The OPCW adopted in a Special Session of the Conference of States Parties held in June 2018 a contentious decision through majority voting to establish a mechanism within the Technical Secretariat to review the FFM reports and identify perpetrators.

The new Investigation and Identification Team (IIT) became fully operational in 2020. Its first report of April 2020 concluded that the Syrian Arab Republic employed chemical weapons in Ltamenah, Syria in March 2017.

In July 2020, the OPCW's executive council initiated a non-compliance procudere against the Syrian Arab Republic, as in accordance with paragraph 36 of

Article VIII of the CWC. The council requested the Syrian Arab Republic, inter alia, to declare the chemical weapons used in the March 2017 attacks, its remaining chemical weapons, and to resolve all of the outstanding issues regarding its initial declaration.

In April 2021, the IIT published its second report, establishing that a helicopter of the Syrian Arab Air Force dropped one cylinder of chlorine over eastern Saraqib on 4 February 2018.

Also in April 2021, the Conference of the States Parties determined the Syrian Arab Republic's non-compliance with the CWC and its failure to declare and destroy all of its chemical weapons. Thus, the Conference stripped Syria off the following rights and privileges under the CWC: a) to vote in the Conference and the Council b) to stand for election to the Council c) to hold any office of the Conference, the Council, or any subsidiary organs Also in August 2015 ISIL attacked Kurdish fighters with mustard agent in north Iraq. With the agreement of the Iraqi government the OPCW has investigated the allegation.

ISIL appears to use CW as a method of warfare rather than as a terrorism tool. It has created an unprecedented legal challenge: use by a non-state actor against another non-state actor on the territory of a CWC state party, which is not under government control. This means that investigations require not only governmental agreement, but also the cooperation from insurgents and neighbouring countries.

The real challenge for the future of the CW prohibition is that beyond investigations, the international community appears unable to react swiftly and decisively. As with earlier wars, no clear paths for holding those criminally responsible during or after war's end seem discernible. This is a significant challenge for the OPCW and UN.

Keeping the World Engaged in the CWC

The CWC (G) is of unlimited duration, but this does not mean that it will last into perpetuity. The treaty is a social construct, and as such developments both inside and outside the regime may affect its relevancy over time. Therefore states parties must update the norm and practices in line with anticipated challenges and lessons learned from crises.

Verification matters

CW destruction operations are projected to end by 2023 at the latest. The ultimate destruction deadline of 2012 will by then have been missed by over a decade. The CWC should already have transitioned into a post-destruction phase. The delay impacts on the future verification (G) regime as the primary focus should already have been on the prevention of future CW armament. This implies that the OPCW should pursue a new compact with the global chemical industry regarding verification, including reporting modalities and onsite inspection routines. For the Technical Secretariat this implies greater emphasis on an industry inspectorate rather than weapon experts, as well as permanent interaction with industry associations worldwide.

Updating the schedules

As explained in Chapter 3, the CWC operates under the General Purpose Criterion (G). This makes the prohibition the default position and a limited list of purposes are considered non-prohibited. For reporting and inspection activities the GPC is too broad to make verification practical. Therefore, the CWC includes 3 Schedules (G), i.e., lists of agents and precursors based on an assessment of their threat to the CWC objectives and their commercial relevancy.

The CWC foresees a simplified amendment procedure for the Schedules (G), but its application has proved politically difficult. Following the assassination attempt with a nerve agent of the so-called Novichok family in the UK, states parties have moved during the Conference of States Parties in November 2019 to include the two principal families of Novichok agents as well as a family of carbamates that have a similar basis for toxicity under Schedule 1. The amendment became effective in June 2020.

Notwithstanding this amendment, the Schedules reflect past CW generations and may require updating in the light of advancements in chemistry. Without such modification, the verification regime will some become obsolete. It would also shift the verification burden to developing countries as this type of chemical industry has tended to relocate to industrialising countries since the 1990s.

Keeping states parties involved

Once destruction operations have been completed many people will likely start to question the continuation of the OPCW (G). The CWC involves many stakeholders: governments, industry, scientitifc comunity, educators, civil society, etc. The OPCW must expand its outreach to them on every continent, notably via training, education, youth engagement, building professional skills and expertise, professional codes, and reaching into areas of chemical safety and security for societies.

Quiz

View quiz at `https://eunpdc-elearning.netlify.app/lu-02/`

5. The EU and Chemical Weapons

In this video, Ambassador Marjolijn van Deelen, the EU's Special Envoy for Non-proliferation and Disarmament, explains

- why chemical weapons control is of particular concern to the European Union,
- how the EU actively supports the work of the OPCW
- and what challenges the Chemical Weapons Convention is currently facing.

We thank the Ambassador for her contribution.

6. Summary and Further Reading

Chemical weapons (G) are the one category of non-conventional weapons that have been and are still being used as a method of warfare (G) in spite of a long history of multilateral agreements to outlaw them.

The Chemical Weapons Convention (G) is today the most sophisticated international tool to prevent chemical warfare (G). It bans not only CW possession, but also the preparatory steps to chemical warfare: development, production and stockpiling of such munitions, as well as training in their offensive deployment. In addition any state party must declare and destroy under international supervision any stockpile it owns.

193 out of 197 UN members and observer states are now party to the CWC. This makes it the most successful weapon control treaty ever concluded. Despite its obvious successes in eliminating CW – the 2013 Nobel Peace Prize testifies to the fact – the OPCW (G) faces important challenges in the mid- to long-term future.

Science and technology do not stand still. This means that new chemical molecules are being designed and possibly commercialised in increasing quantities. Many have properties that could make them interesting for future chemical warfare. The General Purpose Criterion (G) prohibits any such potential, and thus keeps the CWC abreast of such developments.

However, they impact on the CWC'S verification (G)regime. To make reporting and industry inspections manageable the CWC uses three Schedules (G). However, ongoing reluctance to update them threatens to render the monitoring and inspection tools obsolete.

Furthermore, production processes evolve too and affect declaration requirements as well as monitoring requirements.

With the Syrian civil war the CWC has been confronted with chemical warfare, including allegations that a state party is in material breach of its obligations. The OPCW was successful in eliminating Syria's chemical warfare capacity, in spite of some uncertainties. The continuing use of chemical weapons by government and insurgent forces poses a serious challenge to the treaty's intergrity and requires concerted action by the international community.

Terrorism is a challenge for the OPCW. However, through international assistance and cooperation it can strengthen national legal and response capacities to prevent and respond to incidents. Chemical security and safety help to protect critical infrastructure.

Terms

Chemical Weapon (CW)
The toxic agent, the delivery system and specially designed equipment to enable the delivery of the toxic agent. The term applies to each category individually or together, according to the Chemical Weapons Convention.

Furter Reading

Internet resources
- Australia Group (www)
- CWC text (www)
- OPCW (www)
- Syria: OPCW-UN Joint Mission (www)
- Syria: OPCW-UN Joint Investigative Mission (www)
- UNSC Resolution 1540 (2004) (www)
- UNSG Investigative Mechanism (www)
- The Trench (www)

EU and CW disarmament
- EEAS: Disarmament, Non-Proliferation, and Arms Export Control (www)
- EEAS: EU support to the OPCW (www)
- EU Non-Proliferation Consortium (www)